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| | | | ART UNIT 2611 | PAPER NUMBER |

DATE MAILED: 10/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/629,157

Applicant(s)

BLACK ET AL.

Examiner

Julia P. Tu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 26 is objected to because of the following informalities: The examiner suggests to change "reeiver" on line 3 to "receiver." Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 6 and 23 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 6 recites "comparing the first quality metric of the equalizer processed signals to the first quality metric of the RAKE processed signals" whereas claim 2, which claim 6 depends on, recites comparison between the first quality metric and the correction metric with the first and second threshold, respectively. There are two different embodiments of the invention with no connections between those two embodiments; therefore, claim 6 fails to comply with the enablement requirement.
4. Claim 14 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not

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described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The limitation "the sample period is a function of a time constant of an equalizer filter" was not clearly described in the specification.

Claim Rejections - 35 USC § 101

5. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 16 and 18 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Those claims recite processing element for processing computer-readable instructions. It is clear that those claims do not provide concrete and tangible results; therefore, it is defined as nonstatutory matter.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-6, 15, 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smee et al. (WO 02/09305) in view of Porter et al. (6,167,081) and Frank (US 2004/0042537).

(1) with regard to claim 1:

As shown in figure 3, Smee et al. discloses a method of receiving data in a wireless communication system, the method comprising:

processing received signals through a RAKE processing element to generate RAKE processed signals (block 330 in figure, page 3, lines 16-20, note RAKE processing scheme is a second processing scheme);

measuring a first quality metric of the RAKE processed signals (page 3, lines 16-20; page 5, lines 1-6);

Smee et al. do not explicitly teaches comparing the first quality metric of the RAKE processed signals to a first threshold value, and when the first quality metric exceeds the first threshold value, enabling an equalizer.

However, Porter et al. (6,167,081) discloses comparing the first quality metric of the matched filter signals (As shown in Frank's reference, matched filter stage is called RAKE) to a threshold value (column 2, lines 46-51), and when the quality metric exceeds the threshold value, enabling an equalizer (column 2, lines 46-51; column 5, lines, 57-60; column 7, lines 7-9).

As common knowledge of one of ordinary skill in the art to include comparing the quality metric of the RAKE processed signals to a threshold value, and when the quality metric exceeds the threshold value, enabling an equalizer to reduce the effects of multipath (column 2, lines 11-12). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include comparing the quality metric of the RAKE processed signals to a threshold value, and when the quality

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metric exceeds the threshold value, enabling an equalizer as taught by Porter et al. and Frank to the method as taught by Smee et al. so as to provide better quality of the communication system as well as to reduce power consumption (column 8, lines 51-52).

(2) with regard to claim 2:

Smee et al. further teach measuring a correction metric of the RAKE processed signals (page 30, lines 16-22; page 31, lines 1-2); and

comparing the correction metric to a second threshold value (page 31, lines 1-4),

Smee et al., Porter et al., and Frank disclose all of the above subject matters and when the first quality metric exceeds the first threshold value, enabling an equalizer. Frank further teaches when the correction metric exceeds the threshold, the equalizer is used (page 2, paragraph [0022]; note: Frank recites that when the Doppler frequency exceeds the threshold, the output of the RAKE is used; otherwise, the output of the equalizer is used. As a common knowledge of one of ordinary skilled in the art that when the Doppler frequency is large, the fading is small and vice versa. Therefore, when the Doppler frequency is small, the fading is larger than a threshold (i.e. correction metric exceeds the threshold)); consequently, the equalizer is used (i.e. enabling the equalizer)).

It is desirable to include that when the first quality metric exceeds the first threshold value and when the correction metric exceeds the second threshold, enabling an equalizer to reduce the effect of multipath and fading. Therefore, it would have been obvious to one of ordinary skilled in the art at the time the invention was made to

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combine the teaching of Smee et al. and Porter et al. to the teaching of Frank so as to provide better performance of the communication system.

(3) with regard to claim 3:

Smee et al. further teach the first quality metric is a signal to noise ratio (page 30, lines 27-29).

(4) with regard to claim 4:

Smee et al. further teach the correction metric is a cross-correlation measure (page 15, lines 15-26).

(5) with regard to claim 5:

Smee et al. further teach the cross-correlation is measured between pilot bursts (page 15, lines 20-26).

(6) with regard to claim 6:

Smee et al. further teach measuring the first quality metric of the equalizer processed signals (page 30, lines 27-29);

comparing the first quality metric of the equalizer processed signals to the first quality metric of the RAKE processed signals (page 30, lines 27-30); and

when the first quality metric of the equalizer processed signals is less than the first quality metric of the RAKE processed signals disabling the equalizer (see also page

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30, lines 27-30; note that when the quality metric of the equalizer is less than that of RAKE, the selector selects RAKE; therefore, it is obvious to disable the equalizer).

(7) with regard to claim 15:

As shown in figure 3, Smee et al. discloses an apparatus of receiving data in a wireless communication system, the apparatus comprising:

means for processing received signals through a RAKE processing element to generate RAKE processed signals (block 330 in figure, page 3, lines 16-20, note RAKE processing scheme is a second processing scheme);

means for measuring a first quality metric of the RAKE processed signals (page 3, lines 16-20; page 5, lines 1-6);

Smee et al. do not explicitly teach means for comparing the first quality metric of the RAKE processed signals to a first threshold value, and when the first quality metric exceeds the first threshold value, enabling an equalizer.

However, Porter et al. (6,167,081) discloses means for comparing the first quality metric of the matched filter signals (As shown in Frank's reference, matched filter stage is called RAKE) to a threshold value (column 2, lines 46-51), and when the quality metric exceeds the threshold value, enabling an equalizer (column 2, lines 46-51; column 5, lines, 57-60; column 7, lines 7-9).

As common knowledge of one of ordinary skill in the art to include means for comparing the quality metric of the RAKE processed signals to a threshold value, and when the quality metric exceeds the threshold value, enabling an equalizer to reduce the effects of multipath (column 2, lines 11-12). Therefore, it would have been obvious

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to one of ordinary skill in the art at the time the invention was made to include means for comparing the quality metric of the RAKE processed signals to a threshold value, and when the quality metric exceeds the threshold value, enabling an equalizer as taught by Porter et al. and Frank to the apparatus as taught by Smee et al. so as to provide better quality of the communication system as well as to reduce power consumption (column 8, lines 51-52).

(8) with regard to claim 16:

Smee et al., Frank and Porter et al. disclose all of the subject matter as described in claim 1 above, and Porter et al. further disclose processing element for processing computer-readable instructions and memory storage device adapted to store computer-readable instructions (column 3, lines 52-65; column 4, lines 7-15).

One skilled in the art would have clearly recognized that the method of Smee et al. would have included a memory storage to store computer-readable instructions. Therefore, it would have been obvious to include the memory storage as taught by Porter et al. to the method as taught Smee et al., Frank, and Porter et al. in order to provide more accuracy of the communication system.

(9) with regard to claim 19:

As shown in figure 3, Smee et al. disclose a wireless communication apparatus, comprising:

A RAKE receiver (block 330 in figure 3) adapted to receive a signal and generate an estimate of the received signal;

An equalizer (block 310 in figure 3);

Smee et al. disclose all of the above subject matters except for an equalization controller adapted to control operation of the equalizer in response to the estimate from the RAKE receiver.

However, Porter et al. teach means (i.e. a controller) for comparing the first quality metric of the matched filter signals (As shown in Frank's reference, matched filter stage is called RAKE) to a threshold value (column 2, lines 46-51), and when the quality metric exceeds the threshold value, enabling an equalizer (column 2, lines 46-51; column 5, lines, 57-60; column 7, lines 7-9).

As common knowledge of one of ordinary skill in the art to include means for comparing the quality metric of the RAKE processed signals to a threshold value, and when the quality metric exceeds the threshold value, enabling an equalizer to reduce the effects of multipath (column 2, lines 11-12). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include means for comparing the quality metric of the RAKE processed signals to a threshold value, and when the quality metric exceeds the threshold value, enabling an equalizer as taught by Porter et al. and Frank to the method as taught by Smee et al. so as to provide better quality of the communication system as well as to reduce power consumption (column 8, lines 51-52).

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 7-13, 17, and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Smee et al. (WO 02/09305).

(1) with regard to claim 7:

As shown, in figure 3, Smee et al. disclose a method of receiving data in a wireless communication system, the method comprising:

processing received signals through a RAKE processing element to generate RAKE processed signals (block 330 in figure 3, page 3, lines 16-20, note RAKE processing scheme is a second processing scheme); and

periodically testing operating conditions (page 17, lines 17-19), comprising:

processing received signals through an equalizer to generate equalizer processed signals (block 310 in figure 3; page 3, lines 13-16);

measuring a first quality metric of the RAKE processed signals (page 3, lines 18-20; page 5, lines 1-6);

measuring the first quality metric of the equalizer processed signals (page 3, lines 18-20; page 4, lines 24-29);

comparing the first quality metric of the RAKE processed signals to the first quality metric of the equalizer processed signals (page 30, lines 27-30);

determining whether to enable the equalizer based on the comparison (page 30, lines 29-30, determining whether or not to select the equalizer is similar to determine whether or not to enable the equalizer).

(2) with regard to claim 8:

Smee et al. further teach if the first quality metric of the RAKE processed signals exceeds the first quality metric of the equalizer processed signals by a margin amount, then determining whether to enable the equalizer based on the comparison comprises determining to disable the equalizer (page 30, lines 27-30; note that the selector select the signal processing path that provides better S/N; in this case, the selector will select RAKE processed signals; therefore, it is obvious to disable the equalizer).

(3) with regard to claim 9:

Smee et al. further teach if the first quality metric of the RAKE processed signals does not exceed the first quality metric of the equalizer processed signals by the margin amount, then determining whether to enable the equalizer based on the comparison comprises determining to enable the equalizer (page 30, lines 27-30; note that the selector select the signal processing path that provides better S/N; in this case, the

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selector will select equalizer processed signals; therefore, it is obvious to enable the equalizer).

(4) with regard to claim 10:

Smee et al. further teach the first quality metric is a signal to interference and noise ratio (page 30, page 27-29).

(5) with regard to claim 11:

Smee et al. further teach when the equalizer is enabled, the method further comprises:

terminating testing; processing received signals through the equalizer to generate equalizer processed signals (see block 310 in figure 3);

measuring the first quality metric of the RAKE processed signals (page 29, lines 17-20);

measuring the first quality metric of the equalizer processed signals (page 30, lines 25-27);

comparing the first quality metric of the RAKE processed signals to the first quality metric of the equalizer processed signals and determining whether to disable the equalizer based on the comparison (page 30, lines 27-30).

(6) with regard to claim 12:

Smee et al. further teach if the first quality metric of the RAKE processed signals exceeds the first quality metric of the equalizer processed signals by a margin amount, then determining whether to enable the equalizer based on the comparison comprises determining to disable the equalizer (page 30, lines 27-30; note that the selector select the signal processing path that provides better S/N; in this case, the selector will select RAKE processed signals; therefore, it is obvious to disable the equalizer).

(7) with regard to claim 13:

Smee et al. further teach if the first quality metric of the RAKE processed signals does not exceed the first quality metric of the equalizer processed signals by the margin amount, then determining whether to enable the equalizer based on the comparison comprises determining to enable the equalizer (page 30, lines 27-30; note that the selector select the signal processing path that provides better S/N; in this case, the selector will select equalizer processed signals; therefore, it is obvious to enable the equalizer).

(8) with regard to claim 17:

As shown in figure 3, Smee et al. disclose an apparatus for receiving data in a wireless communication system, the apparatus comprising:

means for processing received signals through a RAKE processing element to generate RAKE processed signals (block 330 in figure, page 3, lines 16-20, note RAKE processing scheme is a second processing scheme); and

means for periodically testing operating conditions (page 17, lines 17-19),
comprising:

means for processing received signals through an equalizer to generate
equalizer processed signals (block 310 in figure 3; page 3, lines 13-16);

means for measuring a first quality metric of the RAKE processed signals (page
3, lines 18-20; page 5, lines 1-6);

means for measuring the first quality metric of the equalizer processed signals
(page 3, lines 18-20; page 4, lines 24-29);

means for comparing the first quality metric of the RAKE processed signals to the
first quality metric of the equalizer processed signals (page 30, lines 27-30);

means for determining whether to enable the equalizer based on the comparison
(page 30, lines 29-30, determining whether or not to select the equalizer is similar to
determine whether or not to enable the equalizer).

12. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Smee et al. (WO 02/09305) in view of Porter et al. (6,167,081)

Smee et al. disclose all of the subject matter as described in claim 7 above and further teach processing element for processing computer-readable instructions (page 32, lines 15-24). Smee et al. do not teach a memory storage device adapted to store computer-readable instructions.

However, Porter et al. disclose processing element for processing computer-readable instructions and memory storage device adapted to store computer-readable instructions (column 3, lines 52-65; column 4, lines 7-15).

One skilled in the art would have clearly recognized that the method of Smee et al. would have included a memory storage to store computer-readable instructions. Therefore, it would have been obvious to include the memory storage as taught by Porter et al. to the method as taught Smee et al. in order to provide more accuracy of the communication system.

13. Claim 19 is rejected under 35 U.S.C. 102(b) as being anticipated by Ma et al. (US 2002/0060999).

As shown in figure 3, Ma et al. disclose a wireless communication apparatus, comprising:

a RAKE receiver (blocks 9 in figure 3; note RAKE receiver is known as a combination of despreader outputs for each path) adapted to receive a signal and generate an estimate of the received signal;

an equalizer (blocks 7 in figure 3); and

an equalization controller (block 15 in figure 3) adapted to control operation of the equalizer in response to the estimate from the RAKE receiver (page 3, paragraphs [0052] and [0053]).

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14. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ma et al. (US 2002/0060999) in view of Porter et al. (6,167,081)

Ma et al. disclose all of the subject matters in claim 19 above except for the controller enables the equalizer when a channel quality measure of the estimate is above a threshold value.

However, Porter et al. disclose the controller (i.e. selector 50 in figures 3 and 4) enables the equalizer when a channel quality measure of the estimate (i.e. BER) is above a threshold (column 6, lines 64-66).

One skilled in the art would have recognized that including the controller enables the equalizer when a channel quality measure of the estimate is above the threshold because an equalizer reduce the effects of multipath (column 2, lines 11-12) and BER. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to including the controller enables the equalizer when a channel quality measure of the estimate is above the threshold so as to provide better quality of the communication system as well as to reduce power consumption (column 8, lines 51-52).

15. Claims 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ma et al. (US 2002/0060999) in view of Porter et al. (6,167,081) as applied to claim 20 above, and further in view of Smee et al. (WO 02/09305).

(1) with regard to claim 21:

Ma et al. and Porter et al. disclose all of the above subject matters as applied to claim 20 above except for a first correlation of the estimate is greater than a second correlation of an equalized estimate generated by the equalizer.

However, Smee et al. disclose the equalizer is selected when a first correlation of the estimate is greater than a second correlation of an equalized estimate generated by the equalizer (page 31, lines 1-4).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include the equalizer is selected when a first correlation of the estimate is greater than a second correlation of an equalized estimate generated by the equalizer to reduce the ISI due to multipath and channel distortion (page 3, lines 1-3). Therefore, it would have been obvious to one of ordinary skilled in the art at the time the invention was made to include the equalizer is selected when a first correlation of the estimate is greater than a second correlation of an equalized estimate generated by the equalizer as taught by Smee et al. to the system as taught by Ma et al. and Porter et al.

(2) with regard to claim 22:

Smee et al. further teach the first correlation and the second correlation are based on received pilot signals (page 30, lines 15-23).

16. Claims 23- 25, 30-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ma et al. (US 2002/0060999) in view of Smee et al. (WO 02/09305).

(1) with regard to claim 23:

Ma et al. disclose all of the subject matters in claim 19 above except for the equalizer is disable when a channel quality measure of the estimate from the RAKE receiver is greater than a channel quality measure of an equalized estimate generated by the equalizer

However, Smee et al. further teach the equalizer is disable (i.e. not selected) when a channel quality measure of the estimate from the RAKE receiver is greater than a channel quality measure of an equalized estimate generated by the equalizer (page 30, lines 27-30).

It is desirable to include the equalizer is disable when a channel quality measure of the estimate from the RAKE receiver is greater than a channel quality measure of an equalized estimate generated by the equalizer to achieve the desired performance (page 17, lines 2-3). Therefore, it would have been obvious to one of ordinary skilled in the art at the time the invention was made to include the equalizer is disable when a channel quality measure of the estimate from the RAKE receiver is greater than a channel quality measure of an equalized estimate generated by the equalizer as taught by Smee et al. to the system as taught by Ma et al. so as to provide better performance of the communication system.

(2) with regard to claims 24 and 25:

Ma et al. disclose all of the subject matters in claim 19 above except for the equalization controller periodically enables the equalizer to compare an equalized estimate generated by the equalizer to the estimate from the RAKE receiver.

However, Smee et al. disclose the equalizer is periodically re-adapted (page 17, lines 17-19) to compare an equalized estimate generated by the equalizer to the estimate from the RAKE receiver (page 30, lines 27-30).

It is desirable to include the equalizer is periodically re-adapted to compare an equalized estimate generated by the equalizer to the estimate from the RAKE receiver to achieve the desired performance (page 17, lines 2-3). Therefore, it would have been obvious to one of ordinary skilled in the art at the time the invention was made to include the equalizer is periodically re-adapted to compare an equalized estimate generated by the equalizer to the estimate from the RAKE receiver as taught by Smee et al. to the system as taught by Ma et al. so as to provide better performance of the communication system.

(3) with regard to claims 30 and 31:

Smee et al. further teach the apparatus has two operating modes, comprising: a mode wherein the RAKE receiver is enabled and the equalizer is disabled; a mode wherein the RAKE receiver and equalizer are enabled (see figure 3, page 9 lines 34-38; page 10, lines 1-30; page 30, lines 27-30; note that both RAKE and equalizer are enabled to process the signal, then after comparing, when the quality of RAKE process signal is larger then the quality of the equalizer process signal, the selector will select RAKE, i.e. RAKE is enable, the equalizer is disable).

(4) with regard to claim 32:

Smee et al. further teach a test mode wherein the equalizer is enabled for a sample period and an equalized estimate compared to the estimate from the RAKE

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receiver (page 30, lines 27-30; note that the equalizer is enable to process the signal, then use the equalized estimate to compared with the estimate from the RAKE).

18. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ma et al. (US 2002/0060999) in view of Smee et al. (WO 02/09305) and further in view of Frank (2004/0042537).

Ma et al. and Smee et al. disclose all of the subject matters in claims 19 and 24 above except for the equalization controller compares channel velocity of the equalized estimate generated by the equalizer and the estimate from the RAKE receiver.

However, Frank discloses the Doppler frequency of the equalizer (i.e. channel velocity of the equalized estimate) is compared with the Doppler frequency of the channel fading process (page 2, paragraph [0022]). Frank also teach the comparison between the quality of the equalizer and the quality of the RAKE. Therefore, it would have been obvious to one of ordinary skilled in the art to compare the Doppler frequency of the equalizer (i.e. channel velocity) to the estimate from RAKE receiver to improve channel estimation method that works satisfactorily under slow-to fast fading environments.

17. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ma et al. (US 2002/0060999) in view of Cheng-Quispe et al. (Re. 33,380).

Ma et al. disclose all of the subject matters in claim 19 above except for the equalizer is adapted to operate in a first operating mode and in a second test mode when enabled.

However, Cheng-Quispe et al. disclose the equalizer is adapted to operate in an operating mode and in a test mode (column 25, lines 22-49).

It is desirable to include the equalizer is adapted to operate in an operating mode and in a test mode to retain the flexibility provided by a programmed processor (column 2, lines 36-38). Therefore, it would have been obvious to one of ordinary skilled in the art at the time the invention was made to include the equalizer is adapted to operate in an operating mode and in a test mode because it is relatively inexpensive updating of the data set design (column 3, lines 41-43).

20. Claims 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ma et al. (US 2002/0060999) in view of Cheng-Quispe et al. (Re. 33,380) and further in view of Smee et al. (WO 02/09305).

(1) with regard to claim 28:

Ma et al. and Cheng-Quispe et al disclose all of the subject matters in claims 19 and 27 above except for the equalizer transitions from the second test mode to the first operating mode when a channel quality measure of an equalized estimate generated by the equalizer is greater than a channel quality measure of the estimate from the RAKE receiver.

However, Smee et al. disclose when a channel quality measure of an equalized estimate generated by the equalizer is greater than a channel quality measure of the estimate from the RAKE receiver, the equalizer is selected (i.e. the equalizer is in the operating mode) (page 30, lines 27-30).

It is desirable that when a channel quality measure of an equalized estimate generated by the equalizer is greater than a channel quality measure of the estimate from the RAKE receiver, the equalizer is in the operating mode so as to to achieve the desired performance (page 17, lines 2-3). Therefore, it would have been obvious to one of ordinary skilled in the art at the time the invention was made to include when a channel quality measure of an equalized estimate generated by the equalizer is greater than a channel quality measure of the estimate from the RAKE receiver, the equalizer is in the operating mode as taught by Smee et al. to the system as taught by Ma et al. and Cheng-Quispe et al. so as to provide better performance of the communication system.

(2) with regard to claim 29:

Smee et al. further teach the equalization controller disables the equalizer when a signal-to-noise ratio of the estimate from the RAKE receiver is greater than an equalized estimate from the equalizer (page 30, lines 27-30; note that when SNR of RAKE is greater than that of equalizer, RAKE is selected; therefore, it is obvious that the equalizer is disable).

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Boccuzzi (5,550,868) discloses when the level of delay spread is low, a processor used by the equalizer is freed for other computational tasks or, when the bit error rate permits, is not used at all, thereby realizing a reduction in power consumption in the receiver. Visotsky et al. (US 6,175,588) disclose the SNR for the receiver can be compared to SNR for a matched filter such as a RAKE filter. The limiting performance of the equalizer can be evaluated most directly by computing the SNR of an IIR equalizer.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julia P. Tu whose telephone number is 571-270-1087. The examiner can normally be reached on 7:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh M. Fan can be reached on 571-272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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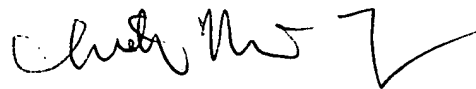
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USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

J.T.

10-13-2006

A handwritten signature in black ink, appearing to read 'Chieh M. Fan', with a large, stylized flourish at the end.

CHIEH M. FAN
SUPERVISORY PATENT EXAMINER